inserted into the tube 42 winding. The panels inserted into the windings are as wide as the spool or reel such that the panels 43 rest on shelves (not shown) on the inner surfaces of the edges of the spools 44. It is preferred that, these layers or planks 43 are pre-curved to avoid point contacts with the tubes and should be made of a material with a Young's modulus higher than that of the buffer tube 42 (unlike the pads 41). The panels 43 act as a shelf separating various groupings of windings of the tube 42 thus avoiding the effects of the compounding stresses of a single wound tube (previously shown and discussed).

In this embodiment, it is also preferred to re-reel the tube 42 onto a different reel after the tube 42 manufacture is complete, and it is allowed to cool to room temperature. It is preferred that the pads 41 be removed during this step to achieve optimum winding of the tubes 42 as they are re-wound on a second reel (not shown).

It is noted that it is contemplated that the above embodiment may be combined with either of the previously discussed embodiments to provide a substantially uniform EFL distribution, or an EFL distribution according to desired specifications. Further, it is contemplated that any of the aspects of the above embodiments may be combined in part or totally to achieve the desired EFL distributions.

Finally, it is noted that to obtain a substantially even EFL distribution other parameters can be optimized, such as increasing the diameter of the reel core to a relatively large starting size reducing the overall length of the manufactured cable to reduce the number of wraps which can create large combined residual loads and more intensive cooling of the tube prior to the spooling of the tube. It is important to note however, that the same dimensions may not be applicable in all cases, and the parameters may need to be adjusted and optimized depending on the materials and tube sizes used.

Figure 41 shows a schematic diagram of an apparatus or system that can be used to perform the method of the present invention. In the system shown, the optical fibers 49 are taken off of their respective payoff reels 48 and drawn through an extruder 50 which places the fibers 49 in a buffer tube 42 which is wound. It is noted that the fibers 49 shown can also be fiber optic ribbons or any other material or grouping to be wound. Further, it is noted that any commonly known devices and components can be used to perform these functions. After the buffer tubes 42 are extruded they are passed through an optional cooling device or system 51, which can be any commonly known or used cooling device. After the tube 42 is cooled the EFL of the tube 42 is measured by an EFL measuring device 52 which can be any commercially available EFL measurement device. After the EFL measurement, the tube passes through a buffer tube tensioner 53. The buffer tube tensioner applies a variable, i.e. non-constant tensile load onto the buffer tube according a desired function, such as monotonically decaying or parabolic function. In the preferred embodiment the tensioner is pneumatic and computer controlled so as to accurately control the tensile load on the buffer tube 42. However, the tensioner 53 can also be hydraulic or mechanical, as long as it is capable of functionally changing the tensile load on the buffer tube 42 in accordance with a desired function. After the tube 42 passes through the tensioner 53 it is wound on a spool 44, having a stiffness compliant pad 45 in accordance with the present invention. The use of the pad 45 is not necessary but is preferred. Further, in a preferred embodiment, a pad inserter 55 places either an additional pad 41 or planks 43 onto the spool 44 with the buffer tube 42 to aid in reducing the EFL. The inserter 55 can be any commonly known or used payout device used to place a material onto a wound spool and can be positioned at any reasonable position regarding the location of the spool 44. The angular velocity of the spool 44 is controlled by

an angular velocity controller 54. The controller 54 is capable of controlling the angular velocity of the spool 44 in accordance with a desired or programmed function to optimize the operation of the system. Finally, in a preferred embodiment of the present invention, a second spool 44' is positioned near the primary spool 44 to allow the buffer tube 42 to be re-wound onto the second spool 44'. The second spool 44' can be either controlled by the same angular velocity control 54 (as shown in Figure 41) or can be controlled by its own independent control (not shown). Further, the pad 41 or planks 43 can either be removed between the first spool 44 and second spool 44' or can be re-wound with the buffer tube 42 depending on the manufacture requirements or specifications of the system. It should also be noted that the second spool 44' can have a buffer pad (not shown) on its core to aid in controlling the EFL of the buffer tube 42.

Further, it should be noted that experiments have shown that heated thermoplastic tubes can be easily and permanently stretched after the tubes are heated. This can be done by using any existing heating techniques including heat radiation from a tubular heater 56 placed between the first 44 and second 44' spools. This procedure would be used in a situation where after the initial spooling of the buffer tubes is completed, and an EFL measurement is made on the spooled tubes, it is found that the EFL of the tube is still not at an acceptably high level or having large EFL variation along the tube length. Instead of scrapping the spooled buffer tubes they can be "re-spooled" onto a second spool 44' while a heater 56 (placed between the spools) heats the buffer tube 42 to allow it to stretch to correct the EFL error that existed in the tube after the first spooling. During the re-spooling and heating of the buffer tubes, the tubes can have an tensile load applied to them in accordance with a method described previously, where for example a second monotonically decaying function